INSTRUCTIONS

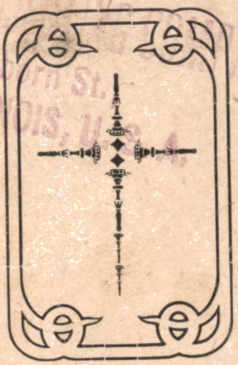
AND

GENERAL INFORMATION

FOR

Motion Picture Exhibitors and Stereopticon Lecturers

THE CHICAGO PROPERTIES COMPANY,
225 Dearborn St.,
CHICAGO, ILLINOIS, U.S.A.



WHO USE

ENTERPRISE INSTRUMENTS AND OUTFITS

1908 EDITION

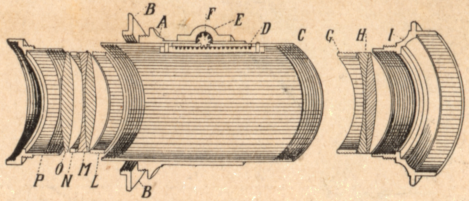


DIAGRAM NO. 1.

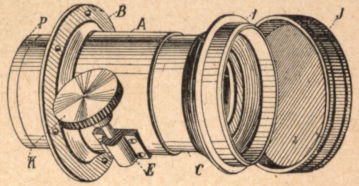


DIAGRAM NO. 2.

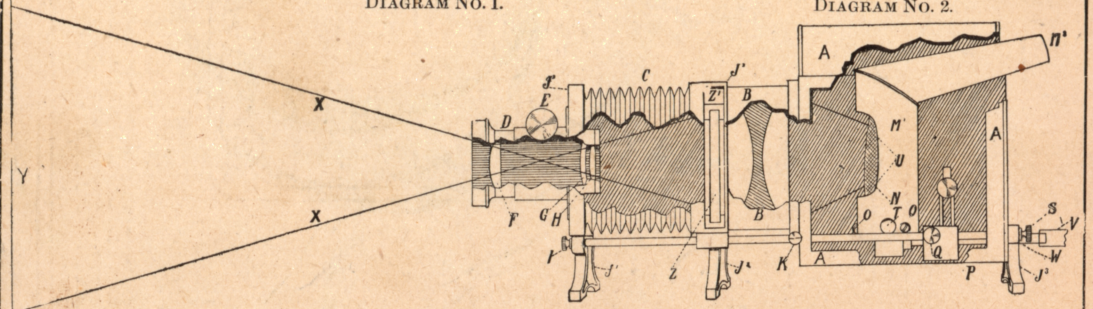


DIAGRAM NO. 3.

The above cuts show sectional views of both the Enterprise Stereopticon and Objective Lens.
For descriptions see following pages.

The Stereopticon.

Description of Parts.

In diagram No. 3, **A** represents the lamp house, **B** the metal mounting, or case for the condensing lenses. **C**, bellows. **D**, objective lens barrel. **E**, thumb nut to rack and pinion. **F**, front objective lens. **G** and **H**, rear objective lenses. **I**, screws for securing sliding attachment for Optigraph. **J**, stereopticon frame. **K**, thumb screws for attaching lamp house to frame of stereopticon. **P**, sliding support for lamp. **Q**, thumb nut screw for holding slide in position. **S**, thumb nut screw for securing rear support of lamp house in position. **M**, metal chimney for lamp. **N**, light opening in chimney. **U**, mantle. **V**, part of rubber connection to lamp. **W**, metal tube, a part of burner. **X**, rays of light. **Y**, screen. **Z**, view holder.

Diagram No. 1 represents a section of the objective lens as though it were cut in two, and diagram No. 2 represents it as a whole, with the leather cap removed. **A**, outside tube of objective lens. **B**, threaded disk which is screwed on to the frame of the stereopticon. **C**, lens barrel, or inside tube. **D**, rack. **E**, pinion bridge. **F**, pinion. **G**, front stop ring for holding lens in position. **H**, front lens composed of a double convex and a double concave lens, which are cemented together, thus making a concavo convex lens. **I**, front lens cell and shade. **J**, leather cover. **K**, thumb screw for operating rack and pinion. **L**, threaded stop ring for holding rear lenses in position. **M**, front lens of rear combination. **N**, ring for separating rear lenses. **O**, back lens of rear combination. **P**, cell for rear lens combination.

The Scientific Principles of the Stereopticon.

The Stereopticon or Magic Lantern is an optical instrument, used in connection with a powerful light, for illuminating transparent photographic views, and projecting large images of them on to a white surface, making them visible to large audiences.

The Dissolving Stereopticon is a combination of two or more stereopticons, and is used to produce what is known as dissolving effects. Each section must be centered and focused on the exact same spot on the screen, so that the view placed in the slide in each stereopticon will be projected in exactly the same place. The best dissolving effects are produced by the use of our calcium, acetylene or vapor light. When using these lights, both stereopticons are connected by what is called a Dissolving Key, which is so arranged that almost all the flow of gas can be turned to one jet, leaving just enough passing to the other, that the light will not be entirely extinguished, and throw all the illumination through one view. When the operator wishes to show another view, he turns the lever of the dissolving key slowly from one side to the other, with no distinct dividing line between them, thus producing a very beautiful effect.

A Double Slide Holder, such as we furnish with our Enterprise Single Stereopticon, makes a most excellent substitute for dissolving view effects, as it enables the operator to dispose of one view and put another into its place so quickly that the intermission between the two is scarcely noticeable.

It is very important that the room or hall should be darkened as completely as possible, and the apparatus should always be kept in most perfect condition to insure the best results. The illumination

Scanned and Donated to Archive.org from the Collection of Darren Nemeth 2026

that has been mostly used for Stereopticon or Magic Lantern projection, is that from a powerful kerosene lamp. But our newly patented Giant Incandescent Vapor Light, or the Acetylene Gas Light are about six times as strong as the kerosene light, and are now the best illumination to be had, short of electric or calcium light. The more powerful the light, the larger and more beautiful the picture can be made to appear on the screen.

Our Enterprise Stereopticons are made interchangeable, so as to permit the use of any of the above mentioned lights in the same instrument, and also is especially arranged for combination with the sliding attachment for the Motion Picture Machine. Either the Motion Picture Machine and sliding attachment, or the top lantern making a double dissolving stereopticon, can be attached by any one in a few minutes.

Description of the Various Parts of the Stereopticon and Their Uses.

The Lamp-house is a sheet iron box, for the purpose of preventing any of the illumination from escaping into the room, except through the condensing and objective lenses.

The condensing lenses consist of a pair of plano-convex lenses about four inches in diameter, perfectly flat on one side and convex on the other. They are usually about 1-16 to ⅛ of an inch thick on the edges, and about ¾ of an inch thick in the center. They are for the purpose of condensing the illumination so as to cause the greatest amount of light to pass through the view, and in turn through the projection or objective lenses.

The objective or projection lenses consist of two combinations of two lenses each. (See cut.)

Each pair is in a separate mounting or cell, and these two cells are screwed into a long brass mounting which is called the lens tube, or barrel, the front of which is provided with a shade that also screws on. The lens tube is screwed into a collar which is attached to the front of the lantern, by small round head screws. The lens mounting is double, one tube telescoping or sliding into the other, and is provided with a rack and pinion operated by a large thumb-nut by means of which a fine adjustment is secured in focusing.

The front pair of lenses are cemented together and form a convexo-concave lens. The convex surface must be toward the front, and the concave surface toward the rear of the lantern.

The rear combination is separated by a metallic band about ⅛ inch wide.

The front lens of the rear combination is a convexo-concave. The convex side should be toward the front of the lantern, and the concave toward the rear.

The back lens of the rear combination is a double convex, but the side with the greatest convexity, should be toward the front.

A small band is screwed into the rear of the front mounting, and one of the same kind into the front of the rear mounting for the purpose of holding the lenses firmly in their places.

A bellows is provided with our Enterprise Stereopticon, and is used between the condensing and the objective lenses for the purpose of preventing any light from escaping into the room, except through the objective lenses, at the same time to allow the objective lenses to be slipped away from or near the condensing lenses for the purpose of adjusting the focus.

The views are photographs on transparant plates (usually glass). The film side of the view is protected by a thin plate of cover glass,

and the two plates are firmly bound together by gummed strips of black binding paper. A mat is used between the two plates and gives the edges of the pictures a finished appearance, having a clean cut edge when thrown on the screen.

The Slide Carrier is a wooden frame so arranged as to hold and center the views before the condensing lenses. We furnish the double slide carrier which enables the operator to change the views rapidly, and is a good substitute for a double stereopticon.

The Carrying Case is a polished wood case in which the lantern is packed for safety, when being transported from one place to another.

The Slide Box is a polished wood case, arranged for holding the views in an upright position, which enables the operator to pick out and show views in regular succession without confusion or error.

The Screen is made of fine white muslin, with usually not to exceed one seam passing through it. They are provided with ropes at each end, and loops on the sides for securing them in an upright position, to stretch them for the prevention of creases, and to give a plain flat surface. A picture may be projected from the stereopticon onto any plain white surface, but for convenience the regular muslin screen is almost invariably used.

Care of the Stereopticon.

When your outfit is received, open the carrying case and carefully remove all of the packing material which has been placed about the instrument and parts for safety in shipping. If the objective lens to the stereopticon has been removed for convenience in packing, attach it to the door on the front of the stereopticon, as shown in illustrations in the catalogue.

The Condensing Lenses are encased in a combination of three thin metal rings, so arranged as to hold them in their proper place. When it is necessary to remove the lens from the casing, for any reason, take hold of the outside casing with one hand, and give it short quick jerks, and hold the other hand in position to catch the inside tube and lenses as they slip out, or put the fingers of both hands on each side of the outside condenser ring, and with the two thumbs press one of the lenses so as to push the lenses and inside tube out.

Clean the condensing lenses carefully, but do not use paper for cleaning the lenses, however soft it may be, or a cotton fabric of any kind. The finest old soft linen will do very well, but a piece of soft chamois skin is decidedly the best.

Abstain as far as possible from touching the lenses with the fingers, as any perspiration left on them, or the accumulation of any dust, is most detrimental to good results. The best way to remove either perspiration or dust is to hold the lenses near to your mouth, with mouth well open, and blow your breath very slowly upon them. This will moisten the surface of the lens, and then by rubbing it very lightly and carefully with the chamois skin or soft linen, all the obstructions can be removed. Too much pressure, even with the chamois skin, is liable to scratch the lens, providing any sand or other gritty substance may have lodged in the material used for cleaning.

The Objective Lenses should be cleaned with even more care than the condensing lenses. The inside surface of the objective lenses are supposed to be perfectly clean before being shipped, but while in use from time to time accumulations of dust and moisture will gather on the inside of the tube, and occasionally it will be necessary to remove the lenses and wipe them carefully. In doing this the utmost care should be exercised to see that the lenses are replaced in their proper

order and position, for unless the lenses are replaced in their proper position, the results will be very unsatisfactory.

Many a lens has been condemned because of the combinations having been removed and not properly replaced. Reference, however, to our diagrams and instructions on one of the preceding pages should prevent any possible misunderstanding.

A morocco covered cap is furnished for the protection of the front lenses, and for use during the exhibition to shut off the light from the screen when no views are being shown. The front lenses should always be capped when not in use.

To Set up and Operate the Stereopticon.

Prepare your light according to the instructions given for the kind of illuminating apparatus you have with your outfit.

For convenience place the lantern at a height which will be about 40 to 42 inches from the floor. A table or box about 30 to 36 inches in height should be secured, and on top of this table place the carrying case which is furnished with the instrument. On top of the carrying case place the instrument, thus bringing the base of the instrument about 40 to 42 inches from the floor. The front end of the instrument should be raised a little higher than the back in order to throw the view high enough to strike the middle of the screen. When the stereopticon is placed in position, the light having been prepared according to the instructions for the same, (see instructions for Giant Incandescent Vapor, Electric, or Calcium Light further on), and, being in good condition, should be placed in its proper position in the lamp-house.

Hanging the Screen. The screens regularly furnished with our special exhibition outfits are 10x12 feet square, and are furnished with ropes and loops for hanging the same. They should be hung with the ropes at the top and bottom, and should be stretched enough to prevent the folds and creases from standing out too prominent.

A light folding frame made of short strips of wood, bolted or screwed together or jointed with ferrules like a jointed fishing rod, has been found a great convenience, as it is always easily put up. When a frame is used, all that is necessary is to put it together, tie the screen to the frame and set it up against the wall, and one or two nails or other fastening is all that is necessary to keep it in place. When the frame is not used, however, nails, screws, or screw eyes can be inserted into the window or door casings, or mouldings for supporting the screen. Suitable ferrules for a jointed screen frame may be had from a sporting goods house; they are used on jointed fishing rods and the cost is but very little.

Size of Picture. On the distance the Stereopticon is set from the screen, depends the size of the picture projected. The farther away the Stereopticon is set, the larger the picture can be made, but the larger the picture, the more light is required; in other words, the illumination being scattered over more surface in a large picture it is not so brilliant as a smaller picture.

With our Enterprise Stereopticon we usually furnish what is known as quarter-size objective lenses. The Stereopticon with a quarter-size objective lens, when set about 20 feet from the screen, will project a picture about 10 feet square. It will sometimes be found convenient to have the Stereopticon farther away from the screen and it can be arranged for such a position by removing the rear combination of lenses from the lens tube. This will enable the operator to project a 10-foot picture at about 40 feet from the screen, and gives about the same results as a two-third size lens.

Now adjust the light, following the instructions for such lighting apparatus as you have with your outfit and the adjustment of the focus is next in order. Insert the slide carrier into the holder in front

of the condensing lenses having the longest portion of the frame at the bottom.

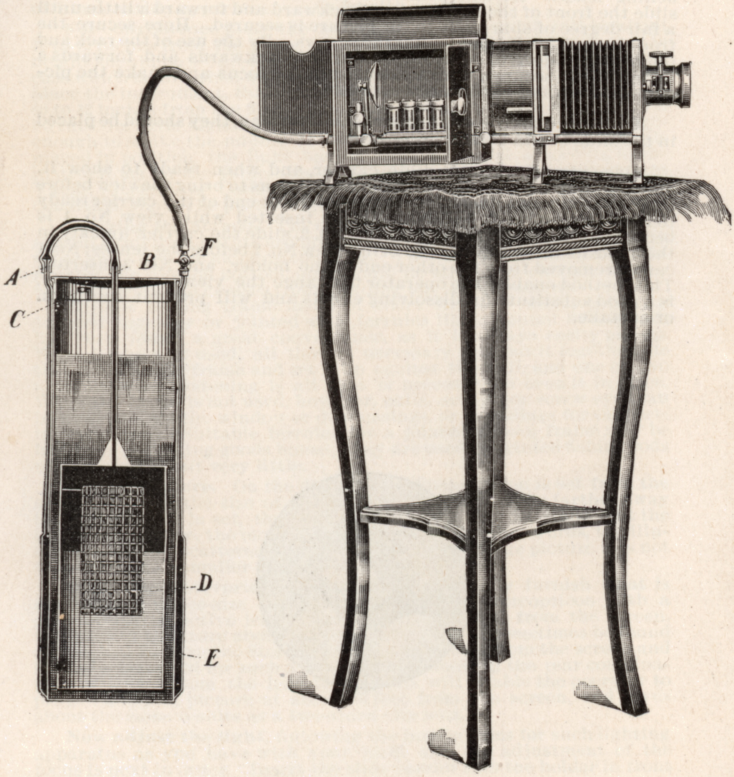
Insert a view with the top part of the same downward (otherwise the view would appear on the screen inverted), and slide the movable part of the carrier so as to bring the view before the condensing lenses.

Turn the thumb nut on the rack and pinion adjustment of the objective lens, and rack the lens back or forward so as to bring it about midway of the distance that it can be shifted. Now slide the front part of the Stereopticon forward until the front part of the objective lens tube is about 7½ inches (if you are using a long focus lens it will be necessary to draw the front out much farther) in front of the condening lenses. At this point the picture should be visible. Now slide the front of the Stereopticon backward and forward a little until a fair degree of sharpness in the picture is secured. Here secure the front in position by tightening the screws. By the use of the rack and pinion, the objective lens can be shifted backwards and forwards a little so as to secure a fine adjustment of the focus and make the picture as sharp as possible on the screen.

To handle the views to the best advantage, they should be placed in the slide box in their regular order.

Place view No. 1 in the slide carrier, and when ready to show it, quickly slide the movable part of carrier so as to bring the view before the condensing lenses. This leaves the other end of the carrier ready to receive view No. 2, which should be inserted while view No. 1 is being shown. When ready for view No. 2, slide the carrier quickly in the opposite direction so as to bring view No. 2 before the lenses; No. 1 can be removed from the other end of the holder, and No. 3 inserted. This method enables the operator to change the views very quickly, is a good substitute for dissolving effects and will prevent confusion or mistake.

The Enterprise ...Acetylene Generator.



DIRECTIONS FOR OPERATING

The Enterprise Acetylene Generator.

Remove top cover by inserting fingers into holes, and turning firmly to the left, which releases cover from lock pin C. To the cover is attached a long metal stem, at the lower end of which a short cylinder is fastened. Within this cylinder a small wire basket D hangs on a hook. Lift wire basket from hook and put carbide into it, sufficient to last during entertainment. (One pound lasts one hour, two pounds for two hours, etc.)

Replace wire basket on hook in cylinder and put all back into original position in large tank, making sure to lock cover down into place as indicated. Now connect stem A with stem B by short piece of rubber tubing. Also connect valve F to burner in Stereopticon by piece of rubber tubing. Should there be any difficulty in connecting rubber tubing moisten the ends with soapy water and they may then be readily adjusted in place.

Now see that valve F is closed, and fill tank (through holes in cover) with cold water to within an inch or two of the top. When this is done the valve F may be opened, and in a few moments the gas will begin to form and flow to burner where it may be lighted, as soon as air has passed out of cylinder and gas begins to escape at burner, where it can instantly be detected by its strong smell.

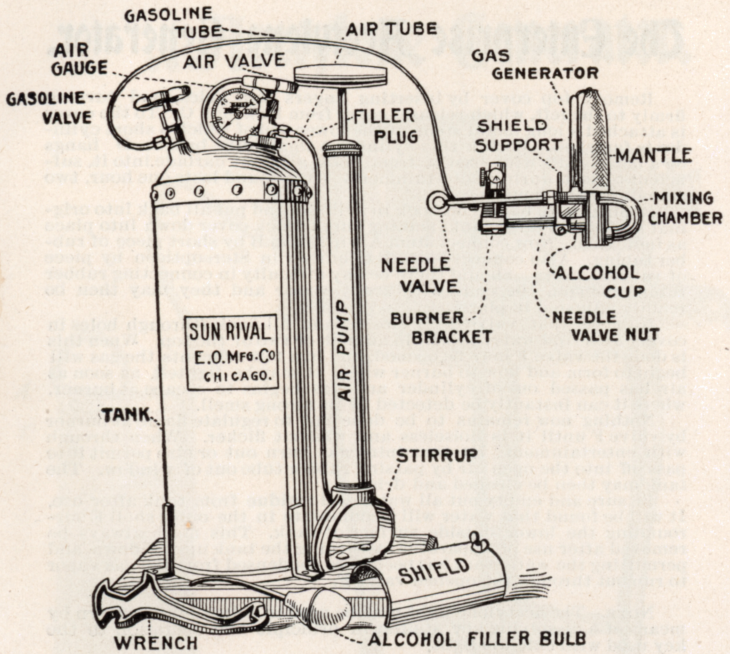
Nothing now remains to be done but to regulate flame at burner by valve F until it is noiseless and without flicker. When through with entertainment, let remaining gas burn out or else permit it to pass off into the open air by passing rubber tube out of window. The tank may then be cleaned and dried.

Be sure and empty out all water and residue from tank after use, It will be found that water will accumulate in the outer shell E surrounding the lower outside surface of tank. This must always be removed after use of apparatus by turning the tank upside down and permitting the water that has been here condensed from the gas vapor to run out through the opened valve F.

NOTE.—The acetylene light may be used in a dissolving lantern by means of a dissolving key, similar in principle and operation to the key used with calcium light.

DIRECTIONS FOR OPERATING THE

Enterprise Sun Rival Hydro-Carbon Gas Outfit.

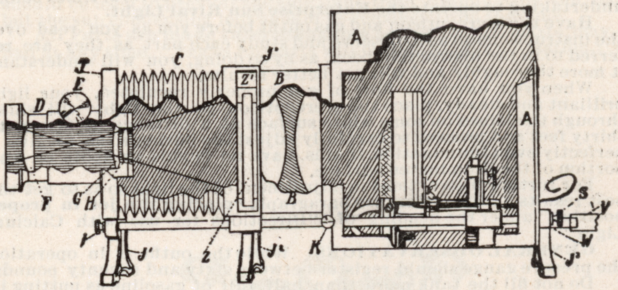


PRINCIPLES OF THE SUN RIVAL GAS LIGHT. The Tank is to be partly filled with gasoline and the balance of the space filled with compressed air, which forces the gasoline up through the flexible gasoline tube and through the gas generator to the burner. The generator must be kept heated to convert the gasoline that passes through it into vapor gas. It is heated to start with, from the alcohol cup and afterwards by the heat from the gas mantle. When the needle valve at the burner is open the vapor gas escapes at a point about one-half inch from the entrance to the mixing chamber. As the gas passes the opening into the mixing chamber it takes with it a sufficient amount of air to convert what otherwise would be a yellow flame into a bright blue flame. The burner is covered with a gas mantle the material of which is made of knitted cotton, saturated

with a mineral salt which makes it indestructible by fire. The combination of the mixed air and gas flame with the mineral salt known as Thorium produces a brilliant incandescent white light over the entire surface of the mantle.

DIRECTIONS FOR USE. With the wrench loosen the small nut and disconnect the air tube from the air valve. Now place the wrench on the filler plug, turn to the left, remove the filler plug entirely from the tank, pour in gasoline until the tank is about one-half full, replace the filler plug and screw down tight. Now connect the air tube to the valve, same as it was when received and tighten the nut moderately with the wrench, open the air valve by turning the wheel on top a few turns to the left and be sure that the gasoline valve is closed. Now place your foot in the stirrup of the air pump and with one or both hands pump the air pressure up until the gauge registers between sixty and seventy pounds, then close the air valve with moderate pressure, to prevent leakage of the air.

The gas mantles are shipped in a round pasteboard box to protect them from injury while in transit, as they are very delicate and must be handled carefully. With each gas mantle is a wire about six inches long for supporting it, and on the left hand side of the burner (looking toward the front of the lantern) is a lug or projection with a perpendicular hole and a screw in the side which



engages with the perpendicular hole. This hole is made to receive the wire mantle support. Now remove the lid from the mantle box, take one of the wire supports and hook the curved end into the little loop on top of the mantle; lift the mantle out of the box and insert the straight end of the wire into the hole in the side of the burner. See that the mantle stands perfectly upright and if it does not, change the position of the wire or bend it sufficiently, that the mantle will stand upright. As a further protection and to prevent them from breaking while in transit, the mantles are coated with parrafine and when the mantle is in position on the burner, this substance must be burned off by lighting it with a match. After burning off the mantle attach the shield to the shield support, with the asbestos lining next to the mantle, and the fork of the support back of the shield. Now bring the burner support which is in the lamp house of the lantern back toward the rear of the lantern as far as it will go and attach the burner to the support by inserting the perpendicular pin on the burner support in the hole in the burner bracket. When the burner has dropped down to a point where it is on a line with the center of the condensing and objective lenses, and is about midway between the two sides of the lamp house, tighten the screw in the burner bracket with sufficient force to hold the burner securely in position. Now attach the end of the flexible gasoline tube to the threaded tube

on the burner and slide the burner and carrier forward until the mantle is within about three inches of the condensing lenses. It will be necessary to provide yourself with a bottle of alcohol for starting the gas generator. Take the alcohol filler bulb between your thumb and fingers, insert the end of the tube in the alcohol, release the pressure and the bulb will fill with alcohol. Place the end of the tube in the alcohol cup on the burner, press the bulb and fill the cup with alcohol. Now light the alcohol that you have placed in the alcohol cup and when it is burned out, open the needle valve by giving it two or three half turns to the left and at the same time hold a lighted match to the mantle. If the generator has been heated sufficiently to convert the gasoline into vapor gas, it will ignite immediately and cover the surface with an intensely brilliant incandescent light. By a little experimenting as to the adjustment, turning it one way or another, it will be an easy matter to adjust the flow of gas so as to give the greatest possible amount of light. The entrance to the mixing chamber is placed a short distance from the gas opening in the generator. Careful experimenting has demonstrated that such an opening furnishes the proper amount of air to produce the most perfect combustion and if by a fall or otherwise the position of the mixing chamber should be changed, it should be restored, as nearly as possible, to its original condition.

NOTE: Read the instructions over carefully several times before undertaking to operate the **Enterprise Sun Rival Light.**

Have the stereopticon and gas outfit before you as you read over the instructions so as to observe and study each part as they are referred to in the instruction book, as by so doing, you will understand it more thoroughly and will get better results.

When you have the flow of gas properly regulated, your light brilliant and steady, place the stereopticon so the light will shine through the lenses on some white surface at a distance of fifteen to thirty feet and proceed to carefully adjust the burner so as to give a perfectly even illumination, that is, have no clouds or spots on any portion of the illuminated surface.

For further instructions in adjustment of the light so as to get the best results on the screen, see paragraph, **"placing the jet in proper position"** under the heading of, "Directions for use with Calcium Light."

GENERAL OBSERVATIONS: While the outfit is in operation the presure gauge should register between sixty and seventy pounds.

Do not fill the tank more than half full of gasoline as putting in more would not leave enough room for air space. The tank will work as well when almost empty but to make sure that you do not run short, it is best to have it at least one quarter full. The gasoline may be measured with a stick or anything else that is convenient but we would recommend a cork, attached to a fine wire a little longer than the height of the tank. Whatever you use, make sure that it is long enough that it will not drop clear into the tank, as it would be very difficult to remove.

Be careful to have the filler plug screwed down tightly with a wrench to prevent the air from leaking. A cone seat is used on the tank and filler plug and taper seats on the gasoline and air tubes to insure perfect connection and care should be used to keep these free from dirt, grit or other obstructions, otherwise they will soon become rough and imperfect and will leak.

The inside of needle valve nut is packed with asbestos to prevent the escape of the gasoline around the needle valve stem; if the gasoline should start leaking at this point, tighten the nut a little with the wrench. This will compress the packing and stop the leak. The connections on the flexible gasoline tube should be reasonably tight but should not be turned too tight as there would be danger of stripping the threads.

It is not always possible to carry the outfit from one exhibiting place to another, with the mantle in place on the burner, without

breaking it as it is very fragile after the protecting material has been burned off. As they are very cheap however, it is of little consequence, except that, the old mantle gives a little better illumination. It is well to always have a good supply of mantles on hand to avoid the possibility of running short. Whenever a fresh mantle is put on, be sure to light it with a match to burn off the protecting material before the gas is turned on.

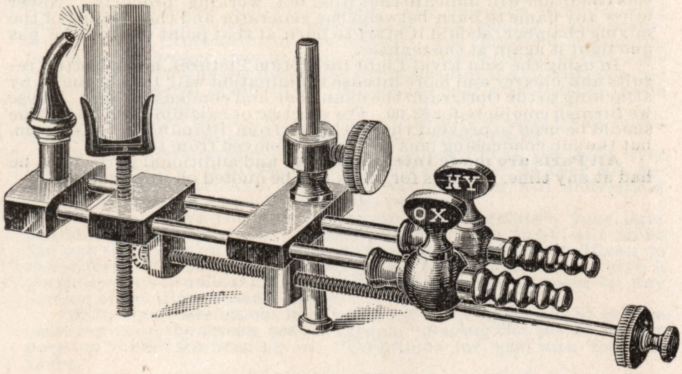
If when turning on the light the illumination seems to be insufficient turn on a little more gas. If by turning the gas full on, the light should still diminish or should rise and fall to a considerable extent, it may be that the generator was not heated sufficiently. If after two or three minutes it continues to be unsteady or diminish it will be necessary to turn off the gas, put in some more alcohol and reheat the generator. The illumination should be exceedingly brilliant, and white all over the surface of the mantle and any variation from this condition will indicate that it is not working properly. Never allow any flame to burn between the generator and the opening of the mixing chamber; should it start to burn at that point turn off the gas and light it again at the mantle.

In using the Sun Rival Light for Motion Pictures, much better results and clearer and more intense illumination will be obtained by attaching to the Optigraph the spun cone and condensing lens. These we furnish complete for $2.00. For electric or calcium light the cone should be used to prevent the side light from illuminating the room, but the sub condensing lens should be removed from the cone.

All Parts are made Interchangable and additional parts may be had at any time. Prices for parts will be quoted on application.

Calcium Light.

This light is known by the names of Oxy-Hydrogen, Calcium or Lime light, and is the most practical and satisfactory method of providing an intense light for Magic Lanterns and Stereopticon illumination. Calcium light is produced by an incandescent surface on a piece of hard, unslaked lime, and is created by the combustion of a combination of oxygen and hydrogen gases. The oxygen and hydrogen gases are each kept in separate tanks or receptacles under heavy pressure, and are connected by rubber tubes to the jet where they combine.



THE CALCIUM LIGHT JET.

A cylinder of lime (about three-fourths of an inch in diameter) is placed in a vertical position in the three-pronged circular fork, near the opening of the jet, and the combustion of the combined gases on its surface creates a small disk of light of dazzling whiteness. The brilliancy of the rays proceeding from this light is so intense that they will illuminate the projected views over an area of 25 or 30 feet square, if necessary. Owing to its extreme intensity it has great penetration, and is, therefore, the most desirable illumination in halls of moderate size, and is almost indispensable for the largest churches, opera houses and theatres. No other light has ever been produced which will equal it, everything considered, for magic lantern or stereopticon projection.

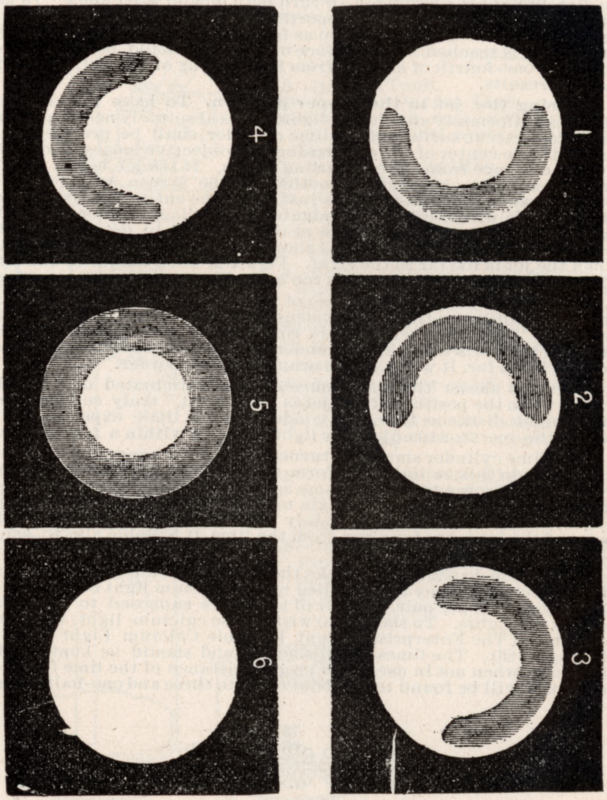
Directions for the Use of Calcium Light.

Some operators use rubber bags for the storing of the hydrogen and oxygen gases, while some prefer to get their supply from the city gas companies in steel tanks made for that purpose, but for use in smaller towns and cities, the portable calcium light and gas making outfit gives the most universal satisfaction. In either case, the receptacles are provided with nipples for attaching the rubber tubes which are used to connect them with the calcium light jets.

The tanks furnished by the city gas companies are painted to designate the kind of gas contained in each. The red tank contains the oxygen while the black tank contains the hydrogen gas.

DIRECTIONS FOR THE USE OF CALCIUM LIGHT.

Slip one end of the rubber tubes onto the nipple of the hydrogen gas tank or bag, and connect the other end with the left hand side of the jet. Connect one end of the other rubber tube with the oxygen bag or tank, and the other to the right side of the calcium jet. Now take a piece of lime from the box in which they are packed, and you will no doubt, find that it is a little too large to go into the holder. Such being the case, take a knife and shave a little off of the three sides, leaving it just large enough so that the lime will fit snugly into the holder, then adjust it so it sets perfectly upright, and when it is revolved by the holder, it will not vary too much from a perfectly upright position.



DIAGRAMS SHOWING ADJUSTMENT OF CALCIUM LIGHT.

DIRECTIONS FOR THE USE OF CALCIUM LIGHT.

The jet should now be placed in the lamp house, with the lime about three or four inches from the condensing lenses.

Open the valve of the hydrogen tank, light the gas at the jet and turn on the hydrogen until the flame is from four to six inches high, then turn on a sufficient amount of the oxygen gas to almost consume the hydrogen flame. When the oxygen is turned on it creates a kind of whistling sound and this will continue until the right proportion of oxygen is mixed with the hydrogen. When the right proportion is reached, the light will burn without any noise whatever and almost no flame. If too much oxygen is turned on it will produce a roaring noise, and if the oxygen is allowed to flow too much in excess of its proper proportion, the light will extinguish itself with a sharp snap. Should this occur, it will be necessary to turn off the oxygen and immediately light the hydrogen, or turn both off and start anew. In adjusting the flow of oxygen in proportion to the hydrogen, it is necessary to turn the valves slowly, so as to be able to stop when the right proportion is reached. The surface of the lime should be about one-eighth to one-fourth of an inch from the opening of the jet, to obtain the best results.

Placing the jet in the proper position. To have the enlarged pictures uniformally and clearly lighted, it is absolutely necessary that the incandescent surface of the lime cylinder shall be precisely on a line with the center of the condensing and objective lenses, and at the correct distance from the condensing lenses. If the jet is not in the proper position, one part or another of the screen will be dark, whereas, when the adjustment is just right, the entire lighted surface of the screen will be evenly illuminated. The diagrams herewith submitted will be of great assistance to the operator in determining the true position of the jet. Figure 1 shows the appearance of the screen when the jet is too far to the right. Figure 2, when too far to the left. Figure 3 indicates that the jet is too high. Figure 4, when it is too low.

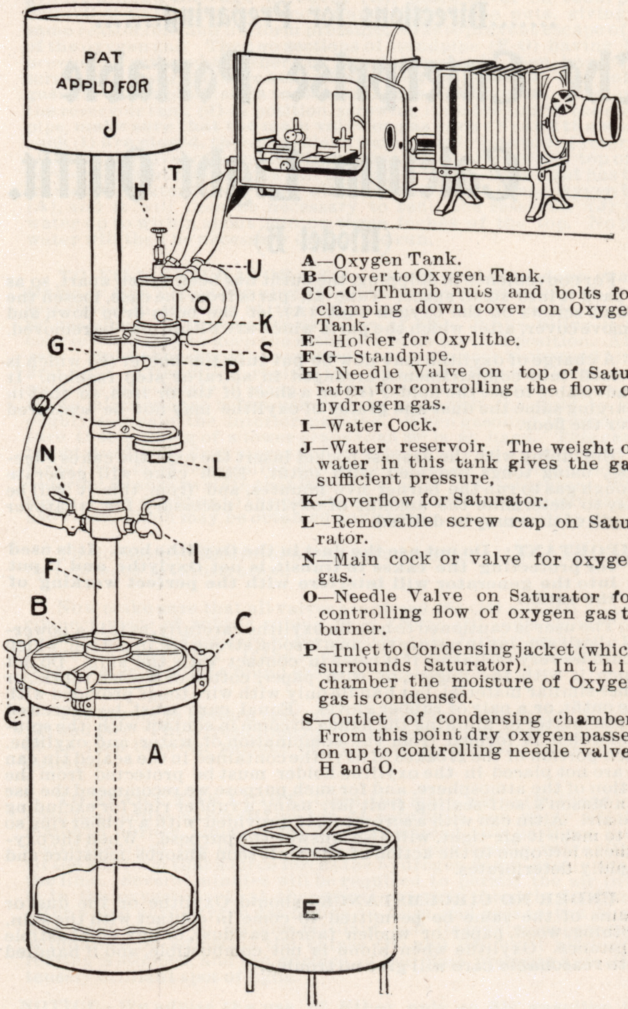
Figure 5 shows the appearance of the screen when the jet is not at the correct distance from the condensers, even though it is correctly centered. The result being a dark ring around the illuminated surface. If the jet is too near the condensers, the rings will have a bluish border, if too far, it will have an orange colored border.

Figure 6 shows the appearance of the illuminated disc on the screen when the position of the jet is "just right," truly centered and at the right distance from the condensers. A little experience will enable the operator to adjust his light properly within a few minutes.

The lime cylinder should be turned as often as every five minutes. Failure to do this is liable to form a pit in the surface of the lime, which may throw a tongue of flame against the condensers, and break them. Usually the light will begin to hiss when the surface is much pitted, and it should be immediately turned. If the opening in the point of the jet is too far away from the lime, it is liable also to cause hissing.

Those who do not care to make their own gas, can get tanks from the large cities. They are supplied by the calcium light companies of this city at $6.25 per pair. A pair of tanks are supposed to last from four to six nights. To those who wish to use calcium light, we would recommend The Enterprise Patent Portable Calcium Light and Gas Making Outfit. The limes are unslacked, and should be kept in air-tight cans when not in use. The proper distance of the lime from the condenser will be found to be about three to three and one-half inches.

... Parts of Model "B." ...



A—Oxygen Tank.
B—Cover to Oxygen Tank.
C-C-C—Thumb nuts and bolts for clamping down cover on Oxygen Tank.
E—Holder for Oxylithe.
F-G—Standpipe.
H—Needle Valve on top of Saturator for controlling the flow of hydrogen gas.
I—Water Cock.
J—Water reservoir. The weight of water in this tank gives the gas sufficient pressure.
K—Overflow for Saturator.
L—Removable screw cap on Saturator.
N—Main cock or valve for oxygen gas.
O—Needle Valve on Saturator for controlling flow of oxygen gas to burner.
P—Inlet to Condensing jacket (which surrounds Saturator). In this chamber the moisture of Oxygen gas is condensed.
S—Outlet of condensing chamber. From this point dry oxygen passes on up to controlling needle valves H and O.

.....Directions for Preparing.....

The Enterprise Portable Calcium Light Outfit.

(Model B)

For convenience in shipping, the outfit has been taken apart, so as to pack it into small space. Take all parts from the case, loosen the thumb screws on the oxygen tank (**A**), let the bolts drop down and remove cover, after which the parts which are within may be removed.

A charge of oxylithe may now be put into the holder (**E**) which is divided into compartments, arranged in spiral or step fashion. It is advisable to set the holder (**E**) on a sheet of tin or iron, so that in charging same the dust and grains of oxylithe may not be scattered over the floor.

Beginning with the deepest pocket insert the oxylithe cakes edgewise, using tongs provided with outfit. Each cake will generate enough gas to run the burner five minutes, and from this it will be easy to determine the amount of oxylithe necessary for whatever length of time may be desired.

IMPORTANT: Do not use the dust in the Oxylithe box. It is used for protecting the cakes in transit, is not Oxylythe and if put into the generator will interfere with the perfect working of the outfit.

The user is cautioned to handle oxylithe carefully, as it is a powerful alkali similar in nature to caustic soda, strong lye, or potash, which would be very irritating if it came in contact with the skin. Do not touch it with the fingers, or with paper, cotton or woolen fabric, or other similar material, but handle only with wire tongs provided with the outfit, or a pair of rubber gloves. Equal care must be exercised in the matter of allowing the hands to come in contact with the solution which is formed from the combination of water and oxylithe. Such portion of the 24 cakes of oxylithe contained in the sealed tin can as are not placed in the oxylithe holder must be protected from the action of the atmosphere, and for such purpose we recommend the use of a Mason's self-sealing fruit jar, using a rubber ring for excluding the air. A tin can with a screw top, if provided with a rubber ring so as to make it air-tight, will also answer the purpose. When the oxylithe is left open to the action of the air it soon absorbs moisture and rapidly deteriorates.

UNDER NO CIRCUMSTANCES should Oxylithe or the dust or grains of the same be permitted to come in contact with the skin, clothing, wood, paper or woolen fabric, sawdust, or any combustible substance. Oxylithe when alone is not combustible, and if handled with reasonable care will give no trouble.

After holder (**E**) has been charged with oxylithe place the holder in tank (**A**). **See that the rubber gasket or washer is in place in the groove around the edge of cover (B),** place cover on tank, place bolts (**C-C-C**) in slots in the cover and tighten the nuts, giving the same reasonable and uniform pressure, so as to prevent escape of any of the oxygen gas. The two sections of standpipe (**F-G**) having been previously screwed together, the standpipe should then be securely screwed to cover (**B**) **care being first taken to see that the rubber gaskets are in place so as to secure a gas tight union.** Now place the reservoir tank (**J**) in position, screwing it on the top of the standpipe, **make sure that the main valve or gas cock (N) and the water-cock (I) are closed,** then pour clean water slowly into top of reservoir (**J**) until the level of same is within about two inches of the top of reservoir. About two gallons will be required. After the light has been started the water in reservoir will slowly sink into lower oxygen tank (**A**), and it will then be necessary to refill the reservoir (**J**) with water up to within about two or three inches of the top. No more water will then be necessary during the run.

TO FILL SATURATOR—(***This should never be done near a flame or fire.***) Remove plug (**T**) and also the overflow cap (**K**). Insert funnel in opening at top and pour in slowly Sulphuric Ether or 88° gasoline until it begins to overflow at (**K**). While filling it is of course necessary to keep the saturator in an upright position. About **ten fluid ounces** will be required when saturator is charged for the first time. After filling, replace the cap screw (**K**) and the plug (**T**), securing same firmly in place. It is advisable to fill the saturator say thirty minutes or so before using, so as to permit the fluid to thoroughly saturate the interior packing. When gasoline is used make sure that nothing of a lower grade than 88° is at hand. This cannot be obtained from drug stores and can only be had in a few of the large cities from responsible dealers in stereopticons, etc., and when ordering be sure to state that it is to be used in a saturator. Where there is any doubt as to the quality of the gasoline it is advisable to use ether, which may be obtained anywhere.

The location of saturator on upright standpipe is best understood by reference to illustration.

Now make sure that all valves are closed (**N**) (**H**) and (**O**) and then connect piece of rubber tubing from (**N**) to (**P**) and a shorter piece from (**S**) to (**U**) taking care to see that the tube is not kinked so as to choke the flow of gas. If the ends of tubing are first moistened with soapy water, it will be found easier to slip them on in place.

The burner in lantern may now be connected to saturator at outlets (**T**) and (**O**). Put a fresh lime in burner allowing a space of about 3-16 of an inch between surface of lime and terminal of goose neck (or outlet).

TO START THE LIGHT—Open the main valve (**N**) then slowly open the needle valve (**H**) on top of saturator, and apply a lighted match to burner, allowing the flame to extend two or three inches above the tip of the burner, then slowly open needle valve (**O**) until the gas from that source forces the hydrogen flame gently against the lime. Several minutes will be required to permit the air (which is in the oxygen tank at the start), to pass through the burner, after which pure oxygen gas begins to form and pass to the burner. The light will then become brilliant, and its maximum power may be obtained by adjusting the valves (**H**) and (**O**), until hissing and roaring is stopped, and the surface of the lime presents a small, intensely brilliant spot of light.

NOTICE—We advise the use of Ether only as 88° gasoline is no longer made.

The supply of saturator gas to burner should be a little in excess of the oxygen. The presence of a small fringe of reddish flame at lime will indicate this.

Hissing or roaring is caused by an excessive supply of one or both gases, and can be stopped by adjusting the needle valves. When the proper adjustment is secured, the light will burn with but little or no attention. After the outfit has been used once or twice the operator will have no difficulty in securing a beautiful, steady and brilliant light.

Snapping and popping is caused by too great a supply of oxygen and not enough hydrogen, or it may be caused by the fluid supply in saturator running low. About four ounces of fluid per hour is required in saturator, and it is advisable **to fill saturator each time it is used,** taking care of course to see that overflow screw **(K)** is removed while filling. Should one of the rubber tubes be blown off with a loud report it is almost certainly due to an empty saturator. While the effect is harmless it is apt to startle an audience, and for this reason it is well to see to it that saturator is properly charged before beginning an exhibition.

When through with the light turn off the main valve **(N)** first, then the needle valve **(O)** and lastly **(H)**. A series of short, snapping sounds may occur when light is extinguished, but these are harmless. This is due to the small amount of gas remaining in the tubes which comes in contact with the hot surface of the lime. Also disconnect burner tubes from saturator. If through with the light, drain off water (if any), from water cock **(I)**, disconnect tube from valve **(N)** and unscrew reservoir **(J)**. Now disconnect rubber tube at **(S)** and slip it over plug **(T)**; this prevents any ether vapor escaping when saturator is not in use. Now unscrew the standpipe **(G)** to which saturator is clamped, and drain out through **(S)** any water which may have formed in the jacket surrounding the saturator.

The iron cover on oxygen tank **(A)** may now be removed, and the tank emptied, after which it should be rinsed out in running water, and wiped with an old cloth. The stand pipe and reservoir **(J)** should also be rinsed out and wiped, and all parts kept clean and dry.

Be careful at all times not to lose the rubber gaskets or washers, which are neeessary to prevent leakage.

Also be careful to see that lead gaskets at (K) and (T) are in place.

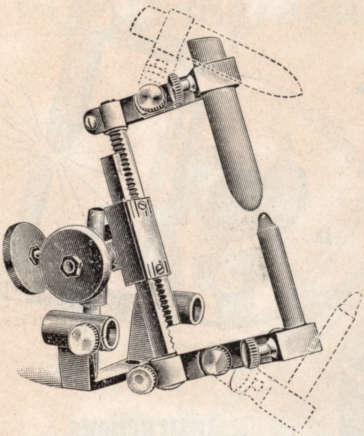
When setting the apparatus up for use, make sure that these are all in place, particularly the large rubber ring fitted in recess of cover, which should be flat and even, and not twisted.

After saturator has been used a dozen times or so the interior filler made of a roll of white flannel should be removed and dried out in the sun out of doors away from flame or light. This is advisable for the reason that gasoline and ether contain a certain amount of non-evaporating substance which remains in saturator and accumulates by repeated use. The lower cap of saturator may be removed by applying wrench at **(L)**. **WHEN THIS CAP IS AGAIN REPLACED MAKE SURE SAME IS STARTED RIGHT ON THE THREAD. THIS IS IMPORTANT IN ORDER TO SECURE A PERFECTLY LEAK-PROOF JOINT.**

Extra flannel fillers for saturator in cylindrical tin case, each 75c

It is advisable to use jet (burner) of small bore. Large bore jets waste gas and do not improve light.

Directions for Using the Enterprise Improved Self-Centering Arc Lamp.



Our Enterprise Electric Arc Lamp is suitable for use with either magic lanterns, Stereopticons or Motion Picture Machines and is provided with what is known as a hand feed adjustment. The carbons must be fed together by turning the handle at the rear of the lamp to compensate for their consumption. **This Lamp can be used on any current**, direct or alternating. The operation of the electric arc lamp is very simple and anyone can operate it after the connections are made; but in making the connections, it should always be done under the supervision of someone who understands the current being used. A rheostat should be used in series with the lamp to regulate the voltage and volume of the current.

The Edison low-tension continuous Current, as used for incandescent lighting, is most suitable for arc lamp projection work. When the above mentioned current is used the upper or positive carbon is consumed twice as rapidly as the lower or negative carbon. To compensate for this inequality in the consumption of the carbons we use in the upper clamp a carbon twice as large as in the lower one; but when using the alternating circuit both carbons are consumed with equal rapidity, and in this case two carbons of the same size are used in the lamp.

The Carbons should be set with the point of the lower one a little further forward than the upper one, so as to throw the illuminated surface a little to the front of the top carbon instead of practically on the point, as it would be if they were both in a direct line with each other. This suggestion applies to the use of the direct current. Where the alternating current is used both carbon points should be set well forward, as indicated by the dotted lines. By this method the illumination is practically toward the condensing lenses.

To connect the lamp one of the feed wires should be attached to the top binding screw on the lamp, another wire should be attached to the lower binding screw on the lamp, and the other end of this wire should be run to one of the binding posts on the rheostat. The other binding post on the rheostat should be connected with the other feed wire. When the current is turned on, turn the wooden knob at rear of the lamp and bring the carbons together until they ignite. Now separate them until the light becomes perfectly steady, and there is as little hissing as possible. If the lamp is properly adjusted it will be almost noiseless.

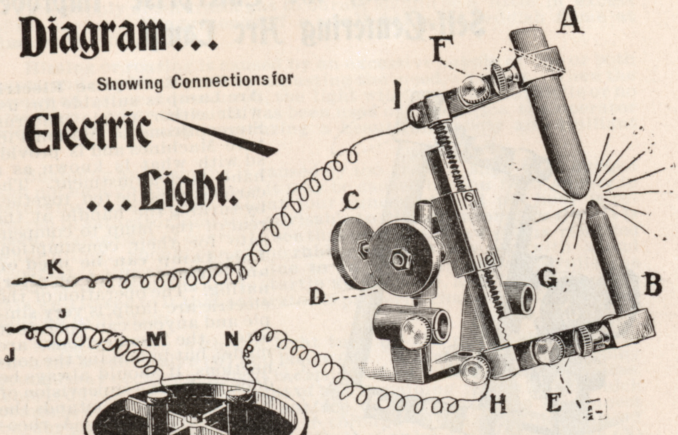
The height and position of the light should be adjusted with the side screw handle. Follow the same instructions for getting the light in proper position, as given for adjusting the calcium light, on another page.

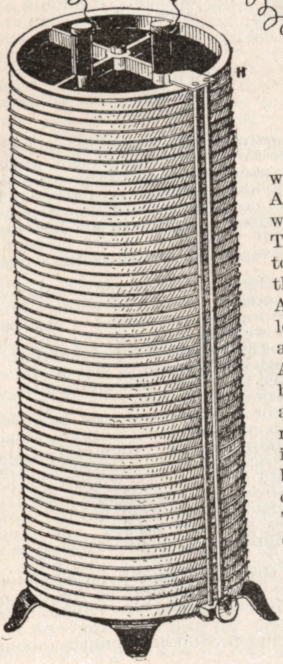
The carbons should be broken in two, and half lengths (about three inches long) used for convenience.

Diagram...

Showing Connections for

Electric ...Light.





...Instructions...

Attach one end of an insulated wire to the main line wire at K. Attach the other end of the same wire to the Arc Lamp at Screw I, This can be done by making a loop. to go under the head of the screw, then turn the screw in to tighten it. Attach one end ot a wire to the lower screw H and the other end to a binding post on the Rheostat at N. Attach one end of another wire to a binding post on the Rheostat at M and the other end of this wire to the main line wire at J. The Rheostat is indicated by L. Our Rheostats have three binding posts. The two outside ones are for 110 volt circuits. The middle one and either of the outside for circuits of 55 volts. If a switch is used it may be inserted between either K and I, J and M or N and H, It is most convenient to have the switch near the operator.

Instructions for

The New Optigraph No. 4 Model 1907

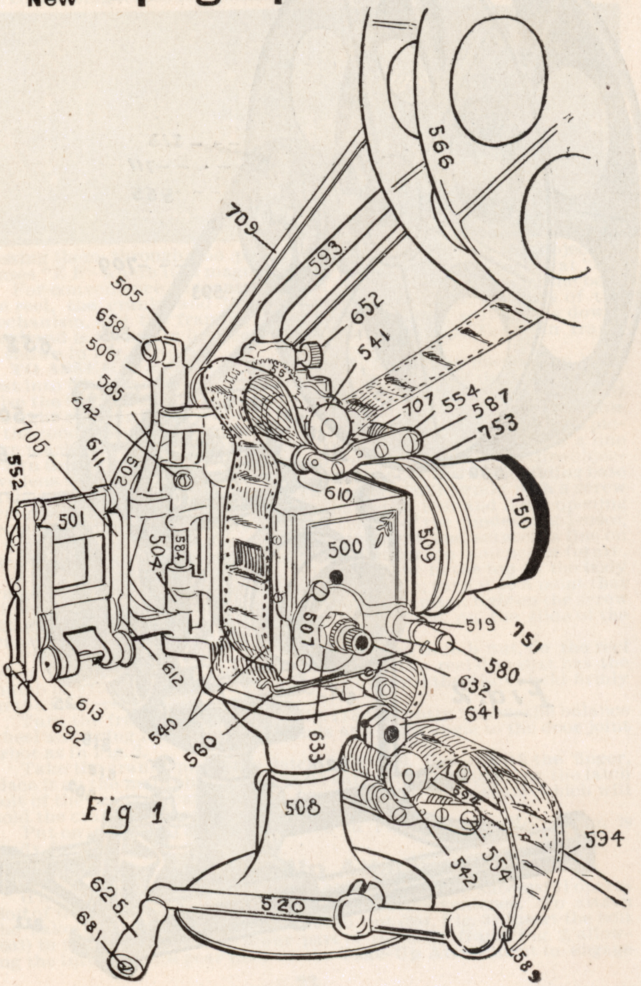


Fig 1

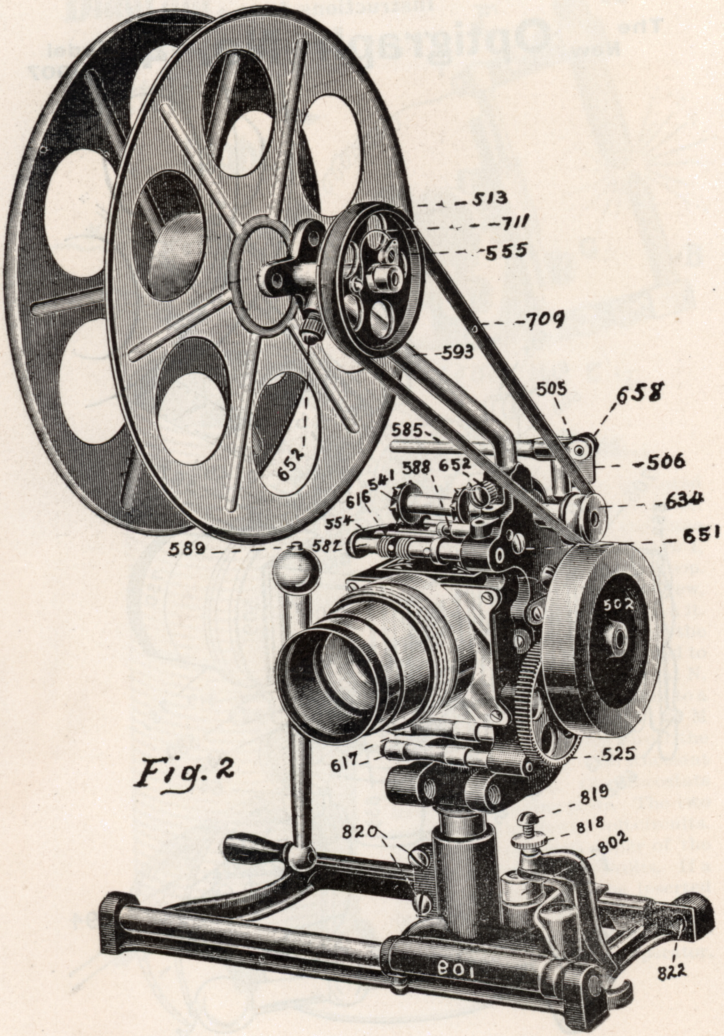
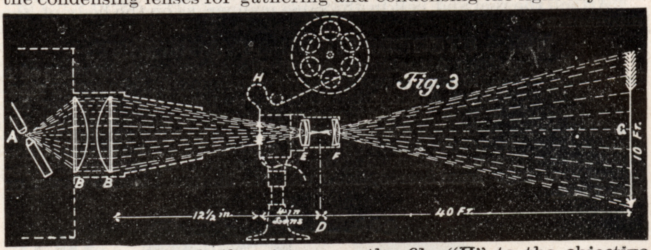

513
711
555
709
593
505
658
585
506
634
651
588
652
541
616
554
589
582
502
617
525
819
818
820
802
822
652
108

Fig. 2

The Mechanism.

The Optical Principle of the Motion Picture Machine is shown by the illustration below. "A" shows the source of illumination, "B B" the condensing lenses for gathering and condensing the light rays and



passing them through the picture on the film "H" to the objective lenses "E F" where it is magnified and projected on the screen at "G."

For convenience in transportation the reel head and arm, the belt, the reel, the crank, and the base is removed from the body of the mechanism, and the framing handle is folded over so it points downward and is turned in between the balance wheel and the main frame as shown in Fig. 1, No. 585.

TO ASSEMBLE THE MECHANISM, insert the mechanism body post into the socket of the triangle slide (801, Fig. 2) of the sliding base, raise the body of the mechanism to a height that will bring the center of the light opening in the gate (501, Fig. 1) to the same height as the center of the condensing lenses of the stereopticon, magic lantern or motion picture machine lamphouse, turn the body of the Mechanism, so a line drawn through the center of the light opening and Motion Picture objective lens would stand at right angles with the slide rod of the sliding base as shown in Fig. 2, and tighten the two screws (820) firmly with a screw driver. After making sure that you have the lens and light opening properly centered for height with the center of the condensing lenses, it would be well to take some sharp instrument and scratch a line on the body post, even with the top of the socket for convenience in future.

Insert the reel arm (593, Fig. 1) in the hole in the top of the body frame, see that it goes to the bottom of the hole, turn it to a point that will bring it square with the body of the Mechanism, tighten the screw (652, Fig. 1) and also the large screw driver screw on the slide of the frame (No. 651, Fig. 2).

Place the reel disc (566, Fig. 8) that has no thumb nut, on the reel arbor or spindle, put on the core block, next the reel disc that has the thumb nut (596) and tighten the thumb nut until the disc is held firmly on the reel arbor.

Turn the framing handle (585, Fig. 1) sufficiently to pass the balance wheel and bring it over until it stands at a right angle to the door joint arbor as in Fig. 2.

Take the crank, press the latch bolt (589, Fig. 1) with the finger, place it on the main shaft (580, Fig. 1) sufficiently far to allow the latch bolt of the crank to catch in the groove of the main shaft which will hold the crank in place.

Put on the belt (709) as indicated in Fig. 1 and the Mechanism is ready for use.

No. 4 Take-Up Attachment.

The Take-Up Attachment is not necessary to the successful operation of the machine, but is considered a great convenience. To attach the Take-Up device, remove the thumb nut (604, Fig. 3) insert the bolt (603) in the two holes in the lower part of the body frame Fig. 2, allowing the intermediate gear (528) on the Take-Up Attachment to engage

with the main gear (525) on the body of the Mechanism Fig. 2 and replace the thumb nut (604) on the bolt (603, Fig. 3).

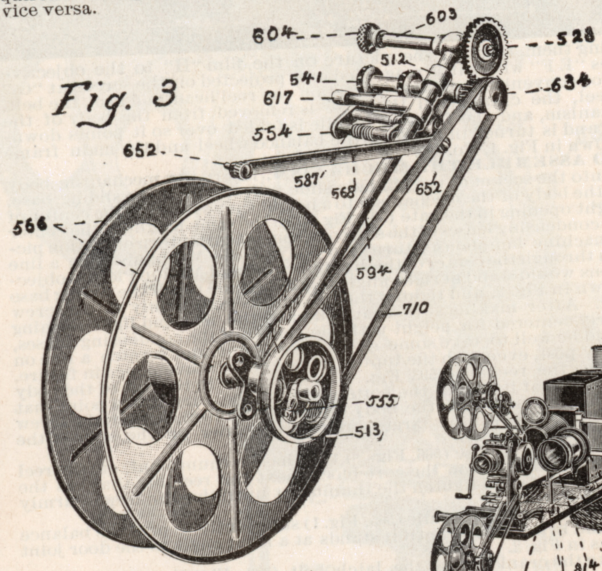
The free end of the support bar (568, Fig 3) is to be attached by the thumb screw (652) to the right hand end of the film pressure roller frame arbor (587, Fig. 2) just in front of the screw 651.

Attach the reel and belt in the same manner as on the body of the mechanism.

NO. 4 STEREOPTICON ATTACHMENT.

The Stereopticon Attachment for the No. 4 Optigraph consists of a bracket, right angle arm, screw ring and an adapter for the screw ring.

The Stereopticon Attachment will not be needed when using the No. 4 Optigraph with the Enterprise Lantern as these lanterns are furnished with a hinged door to support the stereopticon lens. The hinged door, however, is not quite so convenient as the Stereopticon Attachment because when using the latter only one movement is required to change from Stereopticon views to Motion Picture views, or vice versa.



Take-up Attachment

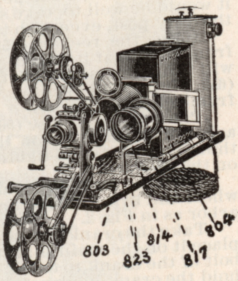
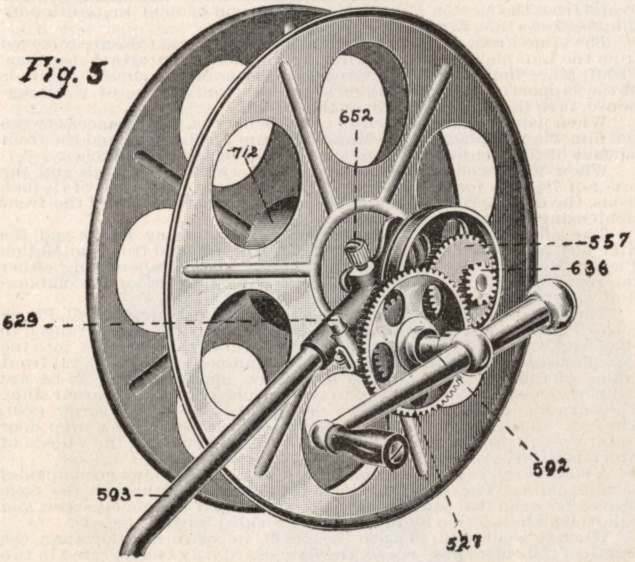


Fig. 4

The Lens Bracket (803, Fig. 4) is to be attached to the under side of the triangle slide (801, Fig. 2) by means of three flat-headed screws which accompany the bracket. The short end of the right angle arm (814, Fig. 4) is to be inserted in the hole in the end of the bracket, with the other end of the arm pointing backward toward the lamp-house. Put screw ring (804, Fig. 8) on the right angle arm, clamp it in place with the thumb screw (817), screw the adaptor (805, Fig. 8) into the screw ring, and screw the Stereopticon Lens (S. L. Fig. 8) into the adaptor.

The coarse adjustment of the Stereopticon Lens is secured by sliding the screw ring (804, Fig. 4) on the right angle arm (814), and the finer adjustment is secured by the rack and pinion adjustment on the lens.

When the light has been properly centered on the light opening of the Motion Picture Mechanism, the sliding base should be pulled over toward the operator, and the Stereopticon Objective Lens centered, so that a clear field of light is thrown on the screen, without changing the position of the Lamphouse, Arc Lamp, or Calcium Jet, and it should also be set so the square of light from the Stereopticon Lens occupies as nearly as possible the same position on the screen as that projected from the Motion Picture Mechanism. The adjustment of the Stereopticon Lens to the center of the condensing lenses, etc., is accomplished by raising and lowering the right angle arm by means of the thumb screws (823, Fig. 4) and by turning the screw ring (804) slightly to one side or the other, and clamping it by the thumb screw (817)



The Compound Rewind Reel Head.

The object of this attachment is to furnish a convenient means of rewinding the films after they have been run through the machine. It will take the place of the regular reel head while the motion pictures are being shown. When it comes to rewinding the film, whether from take-up device, basket, box or bag, remove the belt, and take the crank from the main shaft, and place it on the shaft of the rewind as shown in Fig. 5.

Place the end of the film under one of the clips on the core block or spool, so it will wind over the top of the spool toward the rear of the machine. From the beginning of winding until about five hundred feet of film is wound on the spool, the fast speed should be used. All in

addition to that amount can be wound with greater comfort to the operator and greater safety to the film by using the slow speed.

The change from one speed to the other is accomplished by pressing the spring latch (629, Fig. 5), and shifting the crank shaft gears (527) towards or away from the reel head (as the case may be) which will connect the other pair of gears.

To Assemble the Complete Optigraph Motion Picture Machine.

In setting up the complete machine it will be necessary to observe the following instructions, in addition to those given for the setting up of the mechanism and the stereopticon attachment.

With the complete machine we furnish a jointed oak baseboard, to one end of which is attached the Sliding Base for the Motion Picture Mechanism, while on the other end is mounted the Motion Picture Lamphouse. The Motion Picture Lamphouse has a sliding adjustment to and from the Motion Picture Mechanism and is held in position by thumb screws (870, Fig. 8).

The Cone Front (853), and Condensing Lens Mount (862) are removed from the Lamphouse for safety during shipment. To attach the Cone Front, place the flange of the Condensing Lens Mount under the heads of the supporting screws (874), on the metal front casting of the lamphouse, turn the clamps (865) over the flange.

When using condensing lenses of 6½ inch focus, the distance between the film when in place on the Motion Picture Mechanism, and the front surface of the front condensing lens, should be about 12½ inches.

When using condensing lenses, one of which is 6½ inch and the other of 7½ inch focus, or when both condensing lenses are of 7½ inch focus, the distance between the film and the front surface of the front condensing lens may be as much as 14 inches.

The adjustment for distance between condensing lenses and the film may be secured by sliding the lamp-house to and from the Motion Picture Mechanism. The above instructions apply when using either the regular Motion Picture lamp-house or a Stereopticon in combination with the Motion Picture Mechanism.

The Lamphouse is provided with a Burner Slide Support, (851, Fig. 8) consisting of an upright post attached to a frame, which is arranged to slide backward and forward on two metal tubes that project into the Lamphouse, and are supported by being clamped into the metal front frame of the Lamphouse. The burner on lamp, whether it be arc lamp or calcium jet, is attached to the upright post of the burner slide. The burner slide is held in place on the tubes by thumb screw (859). The cone on the front of the lamphouse is provided with a drop door (854) in which is a sheet of mica with sanded surface, the object of which is to obstruct the light while the film is at rest.

A slide carrier (S. C.) for handling stereopticon views accompanies each machine. The slide carrier should be passed through the cone frame, between the condensing lens mount and the cone proper, and will be held in position by the springs provided for the purpose.

When it is desired to pack the outfit in space smaller than the length of the entire base board, the base board may be separated in two parts by removing the thumb screws from the bolts that hold the board together, and pulling it apart. Compactness may be further facilitated by removing the rods on which the Lamphouse slides, thus separating the Lamphouse from the base.

To Set Up the No. 4 Optigraph Mechanism With a Stereopticon.

When using a Motion Picture Mechanism in combination with a stereopticon, it is best to have the two mounted on a baseboard, in which case the sliding base of the Optigraph Mechanism should be secured with screws to the base board. The front frame of the lantern should be anchored either to the sliding base of the Motion Picture Mechanism

or to the base board, depending on the length of focus of the stereopticon lens that is to be used.

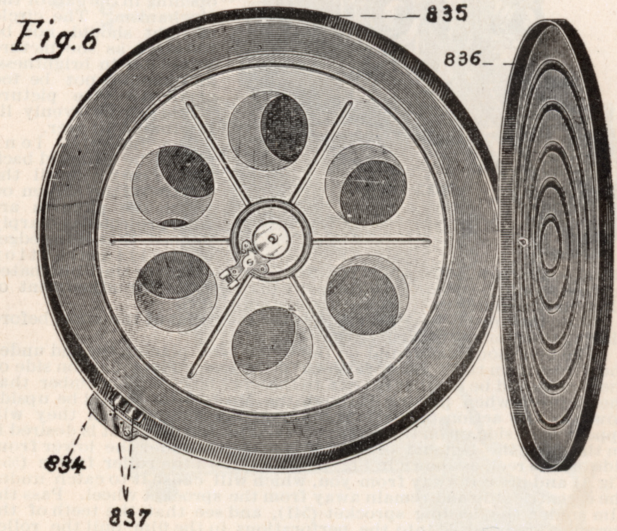
When using a stereopticon lens of 10 inch equivalent focus (known as standard half size), the front frame of the lantern may be anchored to the sliding base of the Mechan sm. When a stereopticon lens of shorter focus is to be used, it will be necessary to anchor the front of the stereopticon frame to the base board, at whatever distance back of the sliding mechanism base may be found necessary to accommodate the focus of the stereopticon lens. When using 8 inch equivalent focus (standard ⅓ size), the front of the stereopticon should be located about 1⅛ to 2 inches back of the sliding base, and for a six inch lens (standard ¼ size) about three inches back of the base.

It is necessary to arrange the relationship, so the center of the condensing lenses of the stereopticon are the same height from the base board, as the center of the light opening in the door of the Motion Picture Mechanism. When using the Enterprise Stereopticon with the No. 4 Optigraph, it is necessary to raise the stereopticon about one inch, and to do this, we have provided a metal truss for the front legs of the frame of the stereopticon and extension legs for the middle and rear legs of the frame.

Base boards, anchor, truss, extension legs, etc., adapted for mounting stereopticons with the Motion Picture Mechanism, will be found listed in our catalogue. The base boards may be had either in one piece or jointed.

A sanded glass should be used in the slide carrier for the purpose of protecting the film while adjusting the light and while focusing the motion picture lens, or at any time when the film is not in motion.

Fire Proof Magazines.



The object of the Fire Proof Magazine is to provide protection to the film while in use, in case through carelessness of the operator the

film should become ignited. It may be used on either our plain or compound reel heads, and is attached by means of three screws passing through the triangle casting which forms a part of the Magazine and into the three ears on the reel head.

The Magazine should be placed on the reel head, so the trap and rollers (834 and 837, Fig. 6) will be nearest to the feeding sprocket, whether it be the upper or lower. After the Magazine has been attached, the reel is placed on the reel spindle inside the Magazine and the film passed between tne rollers (837) in the trap (834).

One of the rollers has its pivots operating in slots and is kept in contact with the other by a mild spring tension.

The Magazine should be kept closed while machine is in operation.

To Operate the Machine.

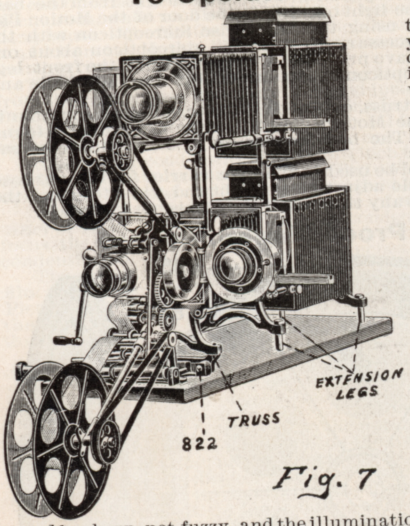


Fig. 7

Slide the Motion Picture Mechanism from you to the extreme end of the sliding base, clamp it in position with the wedge (802, Fig. 2).

Place the burner in position in the lamphouse, turn on the light and adjust the position of the burner backwards and forwards, up and down and sideways, until a bright, clear round light covers the light opening in the gate of the Mechanism. The circle of light should not be too large, as the picture would lose in brightness, and should not be too small as the picture would not be evenly illuminated all over.

The objective lens should be adjusted back and forth until the square on the screen on which the pictures are to be projected is sharply defined, that is the edges of the illumination shoud be sharp, not fuzzy, and the illumination all over the illuminated surface should be even. (See complete instructions for adjustment of illumination under the heading of Calcium Light.)

Close the drop door (854, Fig. 8) over the front of the cone, before placing the film on the Mechanism.

The film should be wound on the upper reel, placing the end under the wire clip on the wood core block of the reel. The emulsion side of the film should be in (that is next to the core block). Remember that the pictures, when passing through the Mechanism should be upside down, as the action of the lens reverses the pictures and they will appear right side up on the screen. When all the film that is desired is on the reel, the last end of the film is brought under the lower front side of the reel, as shown in Fig. 1. Press down the roller frame (554, Fig 1) and press it away from you, which will cause it to catch under the eccentric stop and remain away from the sprocket wheel. Pass the film under the feeding sprocket (541), and see that the teeth of the sprocket are inserted into the perforations in the film, pull the roller frame (554) to you and it will spring into place, holding the film close against the feeding sprocket. Open the gate and place the film

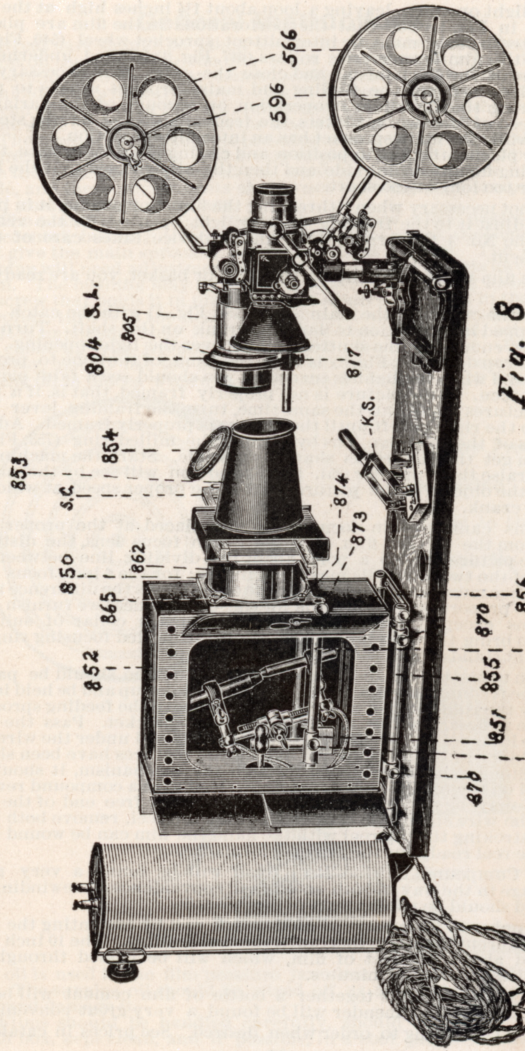

566
596
804
S.L.
805
817
K.S.
853
S.C.
854
874
873
850
862
865
852
856
870
855
860
851
859
876

Fig. 8

over the light opening, leaving a loop about 1½ inches high at the top as shown in Fig, 1. See that the perforations in the film are placed over the teeth of the main or intermittent sprocket wheel (540, Fig. 1) and pass the film between the rollers (617, Fig. 2) located underneath the frame of the Mechanism, and close the gate. It is necessary to leave a loop between the feeding and main sprocket wheels to prevent tearing the film while in operation, on account of the variation of the speed of the two sprockets, the feeding sprocket having steady motion, while the main sprocket has an intermittent motion.

After placing the film in position and closing the door or gate, turn the framing handle to one side and then the other to see that the loop is neither too long or too short.

It is not necessary when "threading the film" or placing it in position, to adjust it to the framing plate or light opening, for the reason that in the No. 4 Optigraph, the framing device takes care of that requirement.

If the film is to be run into a box, bag or basket, you are ready to start.

Place the crank on the main shaft (580, Fig. 1) with the catch bolt (589) snapped into position to hold the crank on the shaft. Turn the crank just enough so the shutter will uncover the light opening. See that the drop door (854, Fig. 8) is over the front of the cone to protect the film and when the light is turned on you should see a faint picture on the screen. If the picture is not properly framed, that is, if a part of two pictures appear at the same time, turn the framing lever (585, Fig. 2) to the right or left until the picture is properly framed. Adjust the focus of the objective lens by turning the milled ring (753, Fig. 1) until you get the picture as sharp as possible. Start the machine in motion, raise the drop door (854, Fig. 8) and you will see by the movement of the objects in the picture what is the proper speed at which to turn the crank.

A lens cannot be in focus until it is placed at the proper distance from the picture film. For the 3 inch focus lens, the distance from the picture film to a point about the dividing line between the glasses of the two lens cells must be 3 inches; for the 6 inch focus lens the distance must be 6 inches and for the other lenses the difference must be in like proportion. To provide for these differences we furnish with each lens except the 3 inch focus an extension collar of suitable length to bring the lens into focus when the milled focusing ring on the mount stands about the middle of its sweep.

When using the Take-Up Attachment, the film should be passed under the feeding sprocket (541, Fig. 3) on the take-up and be held in position by the roller frame with a loose loop above the feeding sprocket, the same as described for the upper feeding sprocket. Pass the film over the idler roller (617, Fig. 3) and attach the end under the wire clip on core block of the take-up reel. After the pictures have been shown by the film having been passed through the mechanism, it should be rewound on the top reel. When not provided with a compound rewind, the film may be rewound as follows: Place the free end of the film under the wire clip of the core block of the top reel, remove both belts and by stroking the top reel with the hand the film can be wound back on to the reel ready for the next performance.

The Compound Rewind Reel Head will be found a very great advantage in the way of both speed and convenience in rewinding the film, and should be made a part of every outfit.

A number of films may be used on one reel by cementing the ends of the different films together until the reel is filled. The 10 inch reels will hold about 1000 feet of film, which will be passed through the Mechanism in about 20 minutes.

For cementing films together a bottle of film cement will be required, and the film mender will be found a very great convenience.

We do cementing to order when desired. See prices in catalogue.

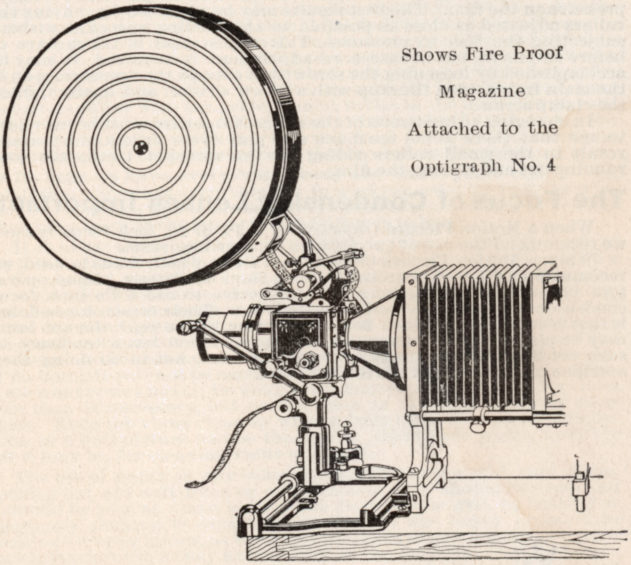
General Instructions.

Great care should be taken never to allow the unobstructed light to rest on the film while the film is not in motion, as by so doing, the film would become almost immediately ignited. The film is made of celluloid and will burn very quickly. When using the stereopticon instead of the Motion Picture lamphouse, a sanded glass should be used in the slide carrier to protect the film while not in motion.

The main sprocket shaft is provided with a bronze adjustable bushing (632, Fig. 1), which is held firmly in place by lock nut (633). At the time the machine is received the necessary adjustments have been made, and these adjustments should not be changed or tampered with until wear makes it necessary.

The center shaft which carries the balance wheel passes through an eccentric bushing, the object of which is to adjust the Geneva parts that give the main sprocket the intermittent motion. The eccentric bushing will need adjustment only when the Geneva parts have become worn. The bushing may be adjusted when necessary by loosening the set screw that holds it in place, insert a small nail or pin in the holes in its collar, turn it to the desired adjustment and tighten the set screw.

It is important that the machine be kept well oiled, otherwise it will choke up, run irregularly, and will soon wear out. Be careful, however, not to use too much oil, and be especially careful about getting oil in places where it will come in contact with the film. If



Shows Fire Proof Magazine Attached to the Optigraph No. 4

any oil is used in the film pressure jaw slots it should be but the least bit. The surplus oil should be wiped off, as it is liable to get on the film and damage it.

Films should be handled carefully, should be placed in a dust proof box, kept clean, and if possible, in a cool place. Films will re-

main more pliable and give better service if kept in a film box with a small sponge moistened with water. If films become torn or damaged they should be carefully mended at once. Remember the old adage that a "stitch in time saves nine."

The movement of the vertical arbor (584, Fig. 1) of the framing device is retarded by the tension bolt (642), the object of which is to hold the framing device at whatever point it is located by the handle (585). Should the picture have a tendency to crawl after having been framed, it will be necessary to increase the tension on the tension bolt (642) by tightening the screw in the end of the bolt by the use of a screw driver.

The outer ends of the Reel Arms, both No. 593 and 594, are each provided with a screw, the purpose of which is to adjust the tension of the reel belts. Should the reel belts not possess sufficient tension to carry the reel forward with regular motion while winding up the film, the belt may be made tighter by removing the reel head, and giving the screw in the end of the reel arm a few turns to the left, which is equivalent to increasing the length of the reel arm. When the belt needs adjustment after the screw is extended as far as it will go, it will be necessary to shorten the belt. The reel head is held in position on the reel arm by a pin in the arm, which slides in a slot in the reel head. The reel head is clamped in place by the screw. (652, Fig. 2.)

The Roller Frame (554, Fig. 1) is provided with an eccentric stop adjustment, (588, Fig. 2) the object of which is to prevent excessive pressure on the film. The best results may be obtained by having the rollers adjusted as close as possible to the feeding sprocket without subjecting the film to pressure. This adjustment is taken care of before shipment, but in case a re-adjustment is required, it may be accomplished by loosening the screw that clamps the eccentric stop in the main frame, turn the stop with a screw driver, and again tighten the clamp screw.

In changing adjustments of the roller frame care must be exercised to see that there is not too much side play of the frame which would result in the small rollers riding on the sprocket teeth, the loop running out and tearing the film.

The Focus of Condensing Lenses Important.

When a Motion Picture Objective of 3, 3½ or 4½ inch focus is used, we recommend the use of two 6½ inch condensing lenses.

When a Motion Picture Objective of 5¼ or 6 inch focus is used, we recommend a 6½ inch rear and 7½ inch front condenser. Some operators prefer when using long focus objective to use a 7½ inch focus condenser in the rear as well as in the front. Their reason for so doing is that when using 7½ inch focus condenser in the rear, the arc lamp may be placed farther from the condenser, which has a tendency to save considerable on breakage of condensers, but in so doing they sacrifice considerable of the illumination.

General Observations.

FOR THE BENEFIT OF EXHIBITORS AND LECTURERS.

Careful attention to the following suggestions will, we think, contribute much to the success of those engaged in this line of work:

Do not undertake to go before the public until you are thoroughly familiar with the operation of your outfit and can go through the different operations almost unconsciously. Throw everything out of adjustment, scatter things about, then readjust, put everything in place, run your films through the Motion Picture Machine, and your slides through the stereopticon one after another in regular succession, until you are so thoroughly familiar with it that you have no fear when you go before the public that you are liable to forget something or make a mistake. Theatrical people who have been on the stage all their lives practice the new play for weeks and even months in advance, and you certainly should not find it a hardship to practice for at least a few days. You will find it a very great satisfaction to yourself on account of the feeling of ease, and certainly it will be a much greater satisfaction to know that you are pleasing the public. At first it would be well to practice by yourself, but after you have become familiar with the performance, invite in the members of your family or most intimate friends, and a little later invite in all the neighbors, and after practicing this way for a few times, or when you have learned to feel perfectly easy, then go before the public.

Be sure to have everything ready and in its place before each exhibition. See that everything is in working order, in fact light up your stereopticon and make sure there is no experimenting to be done when near to, or at the time the exhibition is to begin.

It is always wise and very important to have duplicate parts of anything which is liable to be broken or damaged, and always keep a good supply of materials such as chemicals, advertising matter, etc., for it may sometime save the price of a whole outfit in one evening, and also save the annoyance of disappointing a large audience as well as the danger of getting yourself into bad repute. Magic lantern or stereopticon views should be carefully arranged in the case provided for them, and the set so arranged that the numbers run consecutively. By so doing it will not be necessary to hunt for or examine the views to see what comes next. Do not put the fingers on the face of the views more than is necessary, but handle them as far as possible by their edges. Keep the views clean by wiping from them all dust or perspiration, or a dull picture will be the result. Do not use paper, however soft it may be, for cleaning views or lenses.

The use of paper or any other hard substance would ruin them. Nothing but old soft linen or soft chamois skin should be used, and it should be kept as clean as possible from dirt or grit, by beating or vigorously shaking it occasionally. Do not use heavy pressure in cleaning views or lenses, as the finest particles of grit are liable to produce scratches when they have lodged in the material used for cleaning. There is no better way to remove an accumulation of dust, fog or perspiration from glass than to hold the glass near the mouth with mouth well open, and blow slowly a full breath on the surface, then

immediately wipe the glass with very soft chamois or linen. Chamois is far the best.

Most lecturers operate their own lantern while they are delivering the lecture. This can be done very conveniently, as it places the lecturer near the middle of the audience, where all can hear with ease. and puts him in a position to point with a pencil to any part of the view to which he wishes to attract special attention. A pencil or other small instrument can be used for this purpose, by passing one end immediately in front of the view (not in front of the objective lens) while it is being shown. **Some lecturers employ an operator by preference** to manage the lantern while they deliver the lecture in front of the audience near the projected picture. The operator is also expected to render other valuable services in the way of assisting generally.

Advertising.

In this, like most other lines of business, **advertising is a very important matter** and should be given the most careful attention. **We have made the way easy** by providing the advertising matter already made up for the different exhibitions, illustrated with proper and attractive engravings. **It would cost from $50.00 to $100.00** for the exhibitor to supply himself with a few thousand of one kind of the large advertising posters which we furnish, if he had them made special. This cost would include the setting of the type, the making of the original engravings for the illustrations, the large electrotype plate from which to print the posters, the cost of paper, printing, etc. As the posters are furnished by us, it is only necessary to see that they are distributed and posted up in conspicuous places, on fences, buildings, in store windows, etc. **A newspaper advertisement** will often be found to be a very great advantage in addition to the advertising posters. The length and nature of the advertisement may be governed entirely by the ideas and experience of the exhibitor, besides the town and general conditions, with reference to the locality and the amount it is considered advisable to spend for such purposes.

For the Spanish-American and Filipino Illustrated War Entertainment,

We submit the following suggestion for newspaper advertisement, which should be placed from four days to a week before the entertainment is to be given.

A Trip to Cuba and the Philippines and Return for 25 Cents.

The residents of this city will be treated to an opportunity to make the round trip to Cuba and the Philippines and return in one hour and sixty minutes for 25c. The opportunity comes in the way of a most unique and entertaining panoramic exhibition and lecture, in which will be given full particulars regarding the Spanish-American and Filipino Wars, showing the most important battles and other incidents of special interest. Pictures of the inhabitants, their modes of living, their methods of farming, tropical scenery, etc.

The lecture will be illustrated with fifty-two large size photographic views, many of which are shown in all the colors of nature and magnified to cover 120 square feet of surface. A royal treat is promised and a large attendance is expected. The entertainment will be given under the auspices of the Central Avenue Methodist Church, and a portion of the receipts will go for the benefit of the same.

This entertainment has been very highly complimented by the Logan County Recorder, the Springfield Inquirer, the Des Moines Free Press, and other prominent papers.

If foregoing form is used, any changes may of course, be made to suit the requirements. We only offer it as a suggestion.

It would be best to have the announcement printed in the reading column, in which location it will cost more than a regular notice in the advertising column, **but it is worth much more.** It might be arranged slightly different if put in the regular advertising column, and should be made up with display, in type of different sizes and styles, but if inserted in the reading column, there should be no display excepting the heavy head line which is customary in the reading columns.

Show your vim and enterprise wherever you go and in everything you undertake. **Do not be backward,** but in a gentlemanly way **press forward,** command the attention of those you meet and you will be respected for it.

Never say "I can't" or "I don't believe I am equal to the undertaking." Such thoughts should never enter the mind of any man.

Neatness in personal appearance and politeness in manner are essential to make a good impression on those you meet, and if careful attention is given to these very important points **it will bring dollars to the pocket of the exhibitor,** while the trouble and cost to maintain it will amount to but very little.

"Fine feathers make fine birds" is an old and threadbare adage, but it is too well fitted here to refrain from using it.

Never appear before your audience with your clothes in an untidy condition. Give careful attention to your linen, shave often, keep your hair nicely trimmed, and attend carefully to anything which will add to your personal appearance. The most successful lecturers have been most fastidious in these matters. By this, we do not mean the wearing of jewelry or anything which is gaudy, on the contrary, dress plainly but always neat.

The same neatness should be observed as regards the arrangement of the hall, and many times, at a small expense, the use of a few pots of flowers and other inexpensive decorations would add immensely to the affair. **Many make a great mistake** because they do not realize how largely the popular feeling and sentiment is influenced by what would seem to the exhibitor as being entirely unnecessary.

The above precautions should be observed rigidly when engagements are being made by either an advance agent or the exhibitor himself.

When engagements are to be made by mail some nice neat letter head should be used with your business card printed in the corner, also on the envelopes. For example: "The Winston Illustrated War Lecture and Entertainment Company, Springfield, Ill.

Complimentary tickets can always be given out to advantage, but should be given with judgment and to people of influence, as they will feel highly complimented, and will recommend the entertainment to friends and acquaintances. People to a great extent try to imitate the most influential in their vicinity, and are always anxious to do what the leaders do, and when the best people patronize an entertainment, it is accepted as an indorsement and a guarantee of its merit.

Making engagements is a very important matter and should be attended to far enough in advance to insure that the entertainment will be well advertised and that everybody will have a chance to know of it. The length of time to advertise in advance depends much on the class of entertainment, the locality, the class of people and other conditions. The exhibition should be advertised usually from a week to a few days, but not longer, for if published for more than a week, interest in the affair will be likely to grow old.

Good press notices are a very great assistance, and whenever an opportunity presents itself, the exhibitor should take advantage of it.

and secure as good a write-up as is possible, then take the clipping from the paper in which it appears, have it set up in type and have it printed on small slips to send with letters or to present to the editor of the next paper to influence a good advertisement.

When you meet an editor, whom you think would be accommodating, make arrangements with him for a very liberal advertisement and present him with tickets to admit himself and family to the entertainment, also do anything else you can to contribute to his comfort and pleasure at the entertainment. Whenever anything in this line is done, do it with ease, and do not make it appear that you are putting yourself to any great amount of trouble. Go to him after the entertainment is over, say the next morning, and after asking him how he liked the entertainment, if he expresses himself very favorably, you can prevail upon him to give you a write-up. If he agrees to this suggest what you would like to have him say, and having previously, thought over what you would like to have said you will have it in mind. Make such suggestions as would be a benefit to you as an advertisement.

The business management is easy after you get your outfit and know how you should proceed, at the same time, it must be given the attention it deserves. As to the methods of advertising an entertainment, it seems that to work in connection with churches, societies, etc., has secured the best results. In this way you have the hearty co-operation of the most influential, and the people are at once interested, as they can see that they will not only be benefited by what they will learn, but that there will be also a financial benefit derived.

Propose to the most enterprising churches or societies in a town that you give an exhibition, and that providing they will attend to the advertising, sell the tickets, etc., that you will allow them a portion of the receipts, say from 25 to 40 per cent. You can judge what amount you wish to offer from experience, the conditions, etc. It will be announced in the church or society so that everybody will be familiar with it, and a small bunch of tickets will be placed with each person who would be expected to be in a position to sell them. In this way all the exhibitor has to do is to appear on the evening set to give the entertainment, give the exhibition and take his share of the money.

Another way is to start out the first few days, make arrangements for the use of halls, churches, opera houses, etc., in a number of towns; then go back near to the first place advertised on the day set for the exhibition. Make arrangements for a hall and advertise for an exhibition to come next after the one you last advertised. Return during the late afternoon to the first town you advertised and give your first exhibition. In the same way proceed along the line and you can be able to advertise during the day for an exhibition several days ahead, and give an exhibition every evening.

An advance agent is hired by some exhibitors where they are doing busines on a large scale. He is supposed to go ahead of the exhibitor about a week, make arrangements for the opera houses, halls, advertising, etc., and have everything in readiness so that when the exhibitor or lecturer arrives there is nothing for him to do but to give the entertainment. Sometimes the advance agent is paid a salary only, but the best way is to pay a small salary and a commission on the net amount of money made. This method stimulates the agent to make the very best arrangements and keep down the expenses as far as possible.

A Partner is preferred by some exhibitors, and such an arrangement is very desirable. We fit out many partners with outfits, and they have expressed themselves as much pleased with the results. As a rule one of the partners will go ahead and make engagements, attend to the advertising, etc., while the other follows with the outfit, and gives the entertainment. Money enough for a full outfit cannot always be furnished by one person, and here again it is desirable to

make arrangements with someone who can not only furnish the balance necessary, but be of great assistance in the work.

Select your territory in which you wish to lecture, and in doing so select a good locality, where the people are prosperous, and thrifty, as here you will meet with the best returns. **Do not be afraid of competition,** because some exhibitor may have been through the same territory ahead of you. **Competition is the life of trade.** Your competitor may have been lacking in merit and enterprise, and even if he was not, push right to the front, and convince the people that you wish to give them something in the line of amusement which is superior to anything they have ever seen.

To start with, we would recommend the beginner to select small towns and even the churches, halls and school houses away from the railroads. The exhibitor who does this will meet with the best of results from the start, as there has been almost no competition, and it prepares him to take up the work in the larger towns. By following this method, he can push forward until there is no town or city too large, and no audience too metropolitan or too aristocratic to suit his ambitions, and the possibilities for honor and wealth are almost unlimited.

Advice will at all times be cheerfully furnished, as our success depends entirely on the success of our customers. If there is any particular difficulty which confronts you, or problem, the solution of which will contribute to your success, do not hesitate to write us. We have, in connection with our correspondence department, an expert in this line of work, who keeps strictly up to date in all matters pertaining to public entertainment, and he will give you the benefit of his experience, if you will only ask for it.